V. MR – Maintenance and Repair

A. MR-2 – Calls Answered within 20 Seconds – Interconnect Repair Center

1. Introduction and Background

MR-2 reports on all calls to the Interconnection and Retail Repair Centers. The purpose of this measure is to help evaluate customer access to Qwest's repair centers. The measure focuses on the number of phone calls to the Interconnection and Repair Centers answered within 20 seconds.

MR-2 measures all calls including busies and abandoned calls made to the Interconnect and Repair Center. The time is measured from the customer's first ring at the Automatic Call Distributor *(ACD)* at the time the call is placed in the queue until the call is answered. The time a customer spends in voice response unit *(VRU)* is excluded from the calculations. An abandoned call after the call reaches the ACD is counted as unanswered within the 20-second time interval. Similarly, busies are treated as calls not answered with the 20-second time interval. The ACD automatically records a call count and calculates the time for answering the call.

MR-2 is measured at the region-wide level. The reporting comparisons are CLEC aggregate and Qwest retail levels. The standard of comparison is parity.

Qwest maintains an Account Maintenance Service Center *(AMSC)* in Denver. The AMSC provides service to all CLECs and IXCs. All CLEC and IXC calls to the interconnect repair center are answered by the AMSC. If the queue becomes too large then the switch automatically moves the overflow to the Phoenix Repair Center for response. Retail Repair Call Handling Centers are located in Phoenix, Des Moines, Seattle, and Denver. The data stream for each call identifies whether the call is wholesale or retail. The Class 5-ESS switch contains the necessary logic to recognize whether a call is originated by a CLEC, IXC, or retail customer.

The Demand Forecast Center located in Plymouth, Minnesota downloads the data from the ACDs daily. The data are stored in a SAS database. The SAS database permits Qwest flexibility in querying the database and manipulating the data for differing measurement requirements. Qwest has developed a SAS program to calculate the ratios necessary for reporting MR-2.

The proprietary software that performs the ACD function is resident within the Lucent 5-ESS switch. Lucent developed and maintains the software for this function within Qwest's switch. Qwest does not have the capability to access or in any way reconfigure or reprogram the software without the assistance of Lucent.

2. Overall Summary

MR-2 can be released for OSS testing. There are no outstanding exceptions or observations related to this measure.

3. Analysis

Liberty conducted several interviews during the course of its analysis of this measure. These interviews included both direct and telephone interviews with Qwest personnel responsible for the operation of the AMSC and Repair Call Handling Center *(RCHC)*. In addition, Liberty observed the operation of the AMSC. Liberty found consistency of treatment for wholesale and retail operations.

Liberty also requested substantial documentation on the operation and training of repair center personnel. Again the material indicated that training met the operational requirements of both the wholesale and retail operations.

Because the data used to calculate MR-2 are, for the most part, mechanized, the data tracking performed by Liberty were limited. Liberty initiated its data tracking and recalculation review after the data were stored in the Call Center Access Database *(CCAD)*.

Liberty reviewed the SAS documentation for the calculation of MR-2. The documentation was adequate to determine whether the appropriate data are extracted and used in the calculation of the performance measure. Liberty also requested and received the daily data download totals from the ACDs for the months of August and September. The daily data downloads from the ACDs to CCAD are used by the Data Forecast Center to calculate the wholesale measure results. These results are furnished to Regulatory Research Group to report to the appropriate reporting bodies. Similarly, Liberty recalculated the results for these two months and determined that the SAS program was performing the calculations accurately.

4. Findings and Conclusions

a. Performance Measure Release Date

MR-2 was released effective January 30, 2001.

b. Exceptions

There was one exception (E1034) associated with this measure. Qwest corrected the calls answered column and demonstrated that MR-2 was being calculated correctly. Liberty has closed this exception.

c. Observations

There were no observations associated with this performance measure.

d. Conclusions

Qwest accurately calculates and reports its performance for measure MR-2. The measure provides an accurate comparison of wholesale customers access to repair centers with the access of retail customers to repair centers.

5. Recommendations

Liberty has no recommendations regarding performance measure MR-2. Normal monitoring of monthly performance trends and levels of service should be sufficient to identify potential problems that arise in the future.

B. MR-3 – Out of Service Cleared within 24 Hours, MR-4 – All Troubles Cleared within 48 Hours, MR-5 – All Troubles Cleared within 4 Hours, MR-6 – Mean Time to Restore

1. Introduction and Background

Performance measure MR-3 is used to evaluate the timeliness with which Qwest repairs and closes out-of-service network troubles. It measures the percentage of out-of-service trouble reports that are cleared within 24 hours of the receipt of trouble report for the products specified in the PID. Measures MR-4 and MR-5 are used to evaluate the timeliness with which Qwest clears trouble reports for all service affecting (both service-affecting and out-of-service) troubles. Measure MR-6 is also used to evaluate the timeliness of repairs. MR-4 measures all troubles cleared within 48 hours. MR-5 measures all troubles cleared within 4 hours. MR-6 evaluates the time it takes to restore services to proper operations. For all four of these measures, reporting comparisons are CLEC aggregate, individual CLEC, and Qwest retail results. The standard for comparison of the wholesale results is parity with retail, with the exception of advanced services such as shared loop and enhanced extended links, which are diagnostic measures.

Qwest reports results for MR-3, MR-4, and MR-6 by products that are classified by the following groups: dispatches within MSAs (Metropolitan Statistical Areas), dispatches outside of MSAs, no dispatch, Interval Zone (density) 1, and Interval Zone 2. Results for MR-5 are reported by product as either Interval Zone 1 or Interval Zone 2. The MTAS database is used as the source for data to measure the products that are listed under MSA disaggregation. The WFAC (Work Force Administration Control) database is used as the source for data to measure products listed for Interval Zone-type disaggregation. The basis for reporting of all four measures is the number of trouble reports that are closed during the reporting period and that involve the specified services. Time is measured from the date and time of receipt of the trouble report until the trouble is indicated as cleared.

The PID's formula for MR-3 is:

> *(Number of Out of Service Trouble Reports closed in the reporting period that are cleared within 24 hours) / (Total Number of Out of Service Trouble Reports closed in the reporting period) X 100*

The PID's formula for MR-4 is:

> *(Total trouble reports closed in the reporting period that are cleared within 48 hours) / Total number of reports closed in the reporting period) X 100*

The PID's formula for MR-5 is:

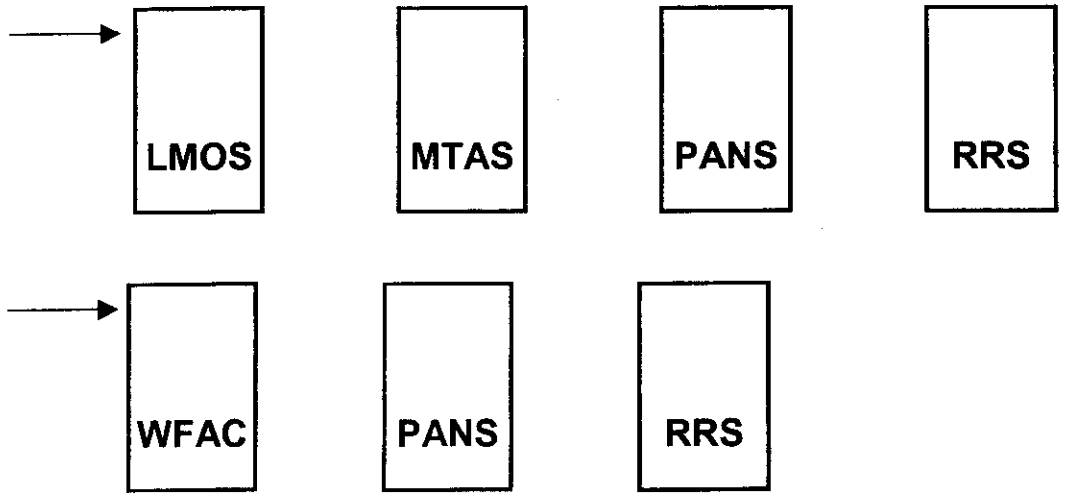
> *(Total trouble reports closed in the reporting period that are cleared within 4 hours) / Total number of reports closed in the reporting period) X 100*

The PID's formula for MR-6 is:

> *Σ(Date & Time Trouble Report Cleared) - (Date & Time Trouble Report Opened) / Total number of reports closed in the reporting period) X 100*

Certain records are excluded in determining the results for these measures. For products measured from MTAS data, trouble reports that are coded with disposition codes for customer action, non-telco plant, trouble beyond the network interface, trouble tickets with time delays due to no access, and other miscellaneous trouble are excluded. Similarly, products measured from WFAC data with trouble codes for carrier action and customer-provided-equipment trouble reports are excluded. Time delays due to "no access" are excluded from repair time. Subsequent trouble tickets, internal information trouble tickets, trouble reports received before installation completion, trouble tickets involving official company services, trouble tickets with invalid trouble receipt dates, trouble tickets with invalid cleared or closed dates, trouble reports of problems received on day of installation before provisioning is complete, trouble tickets with invalid product codes, and records with missing data essential to the calculation of the measurement are all excluded from both the MSA- and Zone-Type measurements.

The data for MR-3, MR-4, and MR-6 are processed as shown in the following diagrams. The data for MR-5 follows the second diagram below.



MSA data are processed by the MTAS system. The trouble ticket is originated when a CLEC calls the AMSC or contacts the repair desk through IMA/MEDIACC with a trouble report. The trouble ticket is populated with a trouble ticket number, date and time of receipt, MCN, trouble description, customer name, and telephone number in LMOS (Line Maintenance Operation System). LMOS populates the trouble ticket with additional information such as repair service bureau, repeat trouble, installation trouble, class of service, area code, and wire center. LMOS

contains expert systems designed to analyze the trouble and to correct the problem when possible. When LMOS cannot solve the problem, the trouble is forwarded to either RCMAC (Recent Change Memory Administration System) or a manual screener. If RCMAC cannot correct the problem, the trouble is forwarded to WFA(DI) or WFA(DO) (DI-dispatch in, DO-dispatch out) depending upon whether the type of trouble is inside or outside plant. WFA(DI) and WFA(DO) are responsible for populating missed appointment and out-of-service. The technician is dispatched if necessary to resolve the trouble. When the problem is repaired, the technician contacts the customer to verify problem solved and completes the date and time of clearing the report and the disposition code, and forwards it to LMOS.

When the trouble ticket is closed, LMOS forwards trouble ticket information at the end of the business day to MTAS for storage. MTAS maintains trouble ticket data for 90 days, after which the information is archived. Upon receiving the trouble ticket information, MTAS sends the information to PANS. PANS serves as the data source used to calculate the performance measures. RRS (Regulatory Reporting System) retrieves the MTAS data from PANS for its calculations.

Interval Zone data are processed by the WFAC system. The trouble ticket is originated when a customer contacts Qwest through either the AMSC-RSA or the repair desk. If the customer enters through the AMSC the trouble is first analyzed by the Repair Call Expert to determine if it is a trouble. If there is trouble, the Repair Service Attendant populates the ticket with the customer name, telephone number or circuit ID, major customer number, and the trouble description. In addition, from the NSDB chronic count, LOC A, LOC C, and service code are added to the trouble ticket. From WFAC the trouble is analyzed by the Integrated Testing Service and if the trouble is solved the trouble ticket is closed in WFAC. Otherwise the Designed Service Center routes the trouble to RCMAC, WFA (DO), or WFA(DI). When the repair technician resolves the trouble the Designed Services Center is notified. WFA Control inputs the data on the clearing times, closed date and time, out-of-service, actual duration, dispatch, and trouble type.

2. Overall Summary

Measures MR-3, MR-4, MR-5, and MR-6 can be released for OSS testing. There are no outstanding observations or exceptions related to these measures.

3. Analysis

Liberty's analysis of these performance measures began with interviews and data requests related to the business process and measure calculation. For both the non-designed services that use MTAS data and designed services that use WFAC data, Liberty reviewed:

- Repair Call Centers - To ascertain how trouble reports are taken, when trouble reports are created, what information is gathered, and where trouble reports are processed.
- The role that MEDIACC plays in the reporting and processing of trouble for wholesale customer and how MEDIACC creates trouble tickets in LMOS and WFAC.

- Line Maintenance Operation System *(LMOS)* – To determine how trouble tickets are created and processed; what information is added and how is ticket cleared and closed; and to determine how non-designed service troubles are managed for wholesale customers.
- Recent Change Memory Administration Center *(RCMAC)* – to determine what role RCMAC has in the maintenance and repair process for non-designed and designed products; to ascertain what fields are populated in the trouble tickets.
- Work Force Administration Control *(WFA/Control)* – to identify responsibilities associated with design services trouble tickets; to determine how trouble tickets are opened and closed; the training for technicians; and the auditing responsibilities.
- Work Force Administration/Dispatch Out *(WFA/(DO)* – to discuss responsibilities of technicians; how trouble tickets are completed for non-designed products; how troubles are cleared and closed; the definition of a commitment; and how trouble tickets are coded.
- MTAS System – to identify the method for storing trouble ticket data and the accessibility of information from front-end systems.
- WFAC – to identify the method for storing trouble ticket data and the accessibility of information from front-end systems.
- PANS – to learn how trouble tickets are stored and what format data are available.
- Wholesale Regulatory Reporting Group – to determine how the performance measures are calculated.

Data Tracking

Liberty tracked MTAS and WFAC data from the front end to the back end of the business process. Liberty initially requested from Qwest 170 randomly selected trouble tickets from retail and wholesale ticket populations in MTAS and WFAC respectively. However, because of the inflexible nature of the WFAC and MTAS systems and the burden that it would have placed on Qwest operations, Liberty agreed to an alternative method for selecting trouble ticket samples. Liberty used samples of wholesale and retail trouble tickets for specified time intervals to track data from MTAS to the RRS detailed database. Liberty required Qwest to pull approximately 170 retail and 170 wholesale trouble tickets directly from MTAS prior to its inclusion in the PANS data set. Liberty used time periods containing trouble tickets closed during the time period extending from August 1, 2000 to October 11, 2000 as its population. Liberty specified the variables that were to be provided by Qwest for each trouble ticket in the selection. Liberty then requested Qwest to pull the same time intervals from the RRS detailed data table. Liberty then compared each trouble report from MTAS to its counterpart in the RRS detail data table to ensure that the report was included when appropriate and similarly excluded when appropriate. Initially, Liberty did identify discrepancies between the data sets because the time periods were incorrectly specified. After the time periods were correctly specified Liberty did not identify any discrepancies. Liberty then compared the variables from each data set for accuracy. Again, Liberty did not identify any discrepancies.

Liberty used the same sampling technique for WFAC data. Liberty again identified specific time intervals for each data sample in order to track the data from WFAC to the RRS detail data table. Because Qwest maintains its WFAC data for only a rolling 45-day period, Liberty was restricted to using the time period extending from August 27, 2000 to October 11, 2000 for its trouble ticket population. Liberty required Qwest to pull approximately 170 wholesale and 170 retail trouble tickets directly from the WFAC data set and not from archived WFAC data in PANS. Liberty specified the variables that were to be provided by Qwest for each trouble report in the selection. The variables included in the data request were for the most part a subset of the same variables that are included in the detail data table. Liberty then requested Qwest to provide trouble reports from the same time intervals from the RRS detailed data table. Liberty compared each WFAC trouble report with its RRS detail database counterpart to determine if the trouble reports that should have been excluded and the trouble reports that should have been included were handled appropriately. Liberty determined that in the WFAC data there were trouble reports with identical numbers that were repeated more than once; however, in the detailed data table this did not occur. In addition, there was some time mismatches because of the nature of the data extraction from WFAC and the detail data table. Liberty was able to match all of the trouble reports numbers with their counterparts in the detail database along with the appropriate variables.

Business Process Audit

Because of the importance of the accuracy of the trouble tickets in the calculation of the MR performance measures, Liberty traced the maintenance and repair process from trouble ticket opened to trouble ticket closed. Liberty interviewed Qwest personnel and submitted data requests for each step of the process. In addition, Liberty requested all training manuals, handbooks, and internal audits of the trouble report process. Liberty also conducted interviews with Qwest personnel responsible for the accuracy of trouble reports.

Recalculation

Liberty conducted several interviews of Qwest personnel in learning about the performance result calculation process for both the wholesale and retail operations. In addition, Qwest responded to a number of data requests related to describing the calculation process and defining the data used. For MR-3, MR-4, MR-5, and MR-6, Liberty requested data contained in the MTAS and WFAC detail data tables and ad hoc data tables.

The raw data are located in the detail data table that is the result of the initial query where Qwest's programming rules are applied. Most exclusions occur at this point in the calculation process so that the detail database contains all trouble reports used for the calculation of the performance measures. Business rules through the SAS code are applied to the MTAS and WFAC detailed data tables to derive fields in the *ad hoc* data table to calculate the performance results.

Liberty used the states of Iowa, New Mexico, and Washington and the data from the months of July 2000 and August 2000 to recalculate the wholesale performance measures. There were 4,813 trouble tickets in the July MTAS detail data table and 5, 055 trouble tickets in the August MTAS detail data table. The WFAC wholesale detail data tables contained 599 trouble reports in July and 726 in August. Liberty then recalculated MR-3, MR-4, MR-5 and MR-6. Liberty was able to accurately recalculate the wholesale performance measures provided by Qwest.

Liberty limited its retail recalculation to July and August for the states of Iowa, New Mexico, and Washington. Liberty audited and recalculated the retail ad hoc files for these states. For the three states there were 155,709 retail trouble reports included in the July MTAS file and 165,532 retail trouble reports in the August MTAS file. The WFAC files were much smaller containing 4,864 trouble reports in July and 10,420 trouble reports in August. In all cases Liberty's results matched those of Qwest.

Because certain fields on the trouble report are used directly in the calculation of the performance reports, the accuracy of the measurements are totally dependent upon technician completing the trouble reports. In reviewing the completion of MTAS trouble reports, Liberty was unable to identify the existence of any internal audits or other studies used to verify either the accuracy of the MTAS trouble tickets or the existence of any internal process at Qwest to ensure the accuracy of the MTAS data. In an interview with Qwest personnel, there was an indication that a single study had been completed on the accuracy of the MTAS trouble tickets. However, when the study was requested, Qwest indicated that it was not a rigorous study and declined to provide it to Liberty. Liberty did review the training manuals beginning with AMSC training through LMOS and WFA(DO) and other related material. Liberty found that the manuals and materials were comprehensive and complete.

Liberty also reviewed the WFAC trouble report completion process. WFAC, unlike MTAS, has most of the fields that are essential to the performance measurements completed by WFA Control and not technicians in the field. For example, the time cleared, closed time and date, dispatch, out-of-service, and actual duration are populated in the trouble ticket by WFA Control. In addition, WFAC conducts periodic audits of designed trouble ticket accuracy at WFAC centers. Liberty reviewed the information examined and the results of some audits provided pursuant to a data request. The audits indicated that Qwest was addressing any accuracy problems involved in WFAC trouble reports.

4. Findings and Conclusions

a. Performance Measure Release Date

MR-3, MR-4, MR-5, and MR-6 were considered ready-for-release as of February 26, 2001.

b. Exceptions

Exception E1035 identified what appeared to be incorrect disaggregation of MTAS data. Qwest contended that the coding was correct and provided a clarification of the RRS documentation to support its point. Qwest revised its documentation and Liberty closed the exception.

Exception E1036 reported that certain WFAC retail trouble tickets were being measured as WFAC wholesale trouble and causing MR-3, MR-4, MR-5, and MR-6 to be incorrectly calculated. Qwest corrected it SAS code so that the trouble tickets were properly attributed to retail measures.

c. Observations

There were no observations related to MR-3 and MR-4.

Observation O1007 reported that the MR-5 and MR-6 calculations were inconsistent with the PID formula. The denominator applied by Qwest for both MR-5 and MR-6 contained the number of trouble report closed, while the PID required the number of trouble reports received. Qwest proposed changes to the PID to correct this problem; the TAG approved the proposed changes.

d. Conclusions

MR-3 accurately measures out-of-service cleared within 24 hours.

MR-4 accurately measures all troubles cleared within 48 hours.

MR-5 accurately measures all troubles cleared within 4 hours.

MR-6 accurately measures the mean time to restore.

5. Recommendations

Qwest should develop an audit process to ensure the accuracy of the MTAS trouble reports. This could be accomplished by using internal auditors with a periodic review by external auditors.

C. MR-7 – Repair Repeat Report Rate, MR-8 – Trouble Rate, MR-9 – Repair Appointments Met

1. Introduction and Background

Performance measure MR-7 is intended to help assess the effectiveness of Qwest's repair actions for specific services. MR-7 reports the number of repeated trouble reports received for the same trouble within 30 calendar days. Performance measure MR-8 is used to evaluate the overall rate of trouble reports as a percentage of the total installed base of the service or product. MR-9 is used to help evaluate the extent to which Qwest repairs services by the appointment date and time. The reporting comparisons for these measures are CLEC aggregate, individual CLEC, and Qwest retail results. The standard for comparison of wholesale results for MR-7, MR-8, and MR-9 is parity with retail, with the exception of advanced services such as shared loop and enhanced extended links, which are diagnostic measures.

The MR-7 results are disaggregated at the state level and reported by products that fall into the following categories: dispatches within MSAs (Metropolitan Statistical Areas), dispatches outside of MSAs, no dispatch, Interval Zone 1 (density), and Interval Zone 2. The MR-8 results are reported at a statewide level for products listed in the PID. The MR-9 results are disaggregated at the state level and reported by products that fall into either dispatches inside of MSAs, dispatches outside of MSA, and no dispatch. The MTAS database is used to measure the products that are listed for MSA-type disaggregation. The WFAC database is used to measure products listed for interval zone-type disaggregation. The measurements include all trouble reports that are closed during the reporting period that involve the services specified in the PID.

Some records are excluded from the calculation of these measures. For products measured from MTAS data, trouble reports are excluded that are coded with disposition codes for customer

action, non-telco plant, trouble beyond the network interface, trouble tickets with time delays due to no access, and other miscellaneous classifications. Similarly, products measured from WFAC data with trouble codes for carrier action and customer provided equipment trouble reports are excluded. Time delays due to "no access" are excluded from the reported repair time in WFAC. Subsequent trouble tickets, internal information trouble tickets, trouble reports received before installation completion, trouble tickets involving official company services, trouble tickets with invalid trouble receipt dates, trouble tickets with invalid cleared or closed dates, trouble reports of problems received on day of installation before provisioning is complete, trouble tickets with invalid product codes, and records with missing data essential to the calculation of the measure are all excluded from both the MSA- and Interval Zone-type measurements.

The PID's formula for MR-7 is:

> *[(Total repeated trouble reports closed within the reporting period that were received within 30 calendar days of when the preceding initial trouble report closed) / (Total Number of Out of Service Trouble Reports closed in the reporting period)] X 100*

The PID's formula for MR-8 is:

> *[(Total number of trouble reports closed in the reporting period involving the specified service grouping) / (Total number of the specified services that are in service in the report period)] X 100*

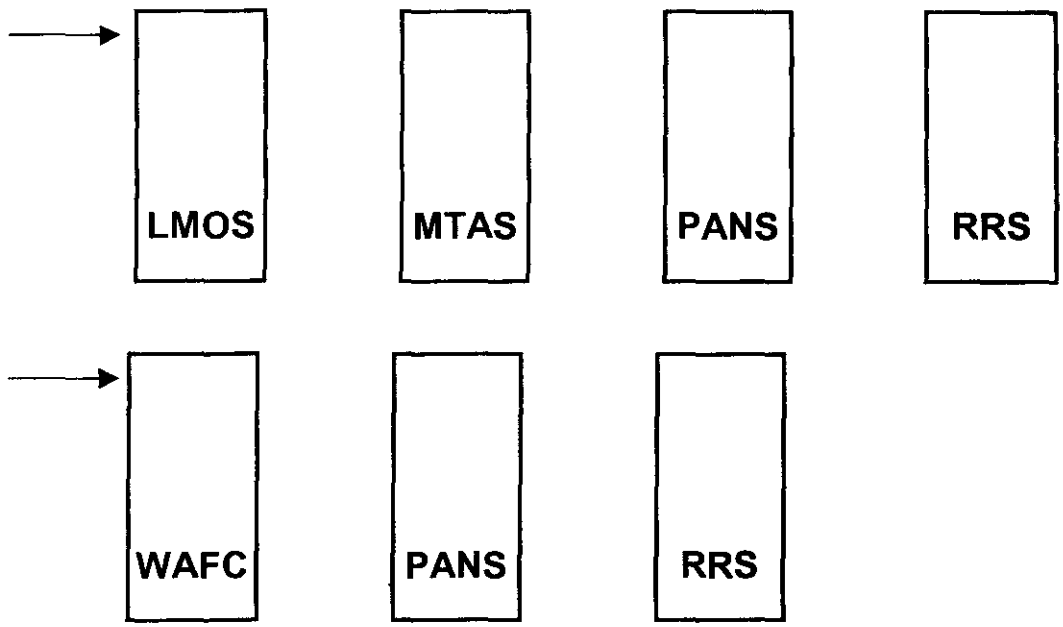
The PID's formula for MR-9 is:

> *[(Total trouble reports cleared by appointment date and time) / (Total Number of Out of Service Trouble Reports closed in the reporting period)] X 100*

Data used to calculate the MR-7 results are generated by the MTAS and WFAC systems. MTAS maintains the data used to generate the MSA-type products. WFAC maintains the data used to generate the zone-type products.

The data used to calculate the numerator of MR-8 are generated by the MTAS and WFAC data systems. The TIRKS database stores and generates the data used to generate the denominator for MR-8.

The data for MR-7 are processed as shown in the following two diagrams. The data for MR-9 are processed as shown in the second diagram.



In the MTAS system, a trouble ticket is originated when a CLEC calls the AMSC or contacts the repair desk through IMA/MEDIACC. The trouble ticket is populated with a trouble ticket number, received date and time, MCN, trouble description, customer name, and telephone number in LMOS. LMOS populates the trouble ticket with additional information such as repair service bureau, repeat trouble, installation trouble, class of service, area code, and wire center. LMOS contains expert systems designed to analyze the trouble and to correct the problem when possible. When LMOS cannot solve the problem, the trouble is forwarded to either RCMAC or a manual screener. If RCMAC cannot correct the problem, the trouble is forwarded to WFA(DI) or WFA(DO) depending upon whether the type of trouble is inside or outside plant. WFA(DO) and WFA(DI) are responsible for populating missed appointment and out-of-service occurrences. The technician is dispatched if necessary to resolve the trouble. When the problem is repaired, the technician contacts the customer to verify problem solved and populates the date and time the report cleared, the disposition code, and the date and time closed, and forwards it to LMOS.

When a trouble ticket is closed, it is forwarded at the end of the business day by LMOS to MTAS. MTAS maintains the trouble ticket data for 90 days, after which the data are archived. In addition, MTAS stores selected trouble ticket data in PANS. PANS MTAS serves as the source of data used to calculate the PIDS. RRS retrieves the MTAS data from PANS for its calculations.

In the WFAC system, a trouble ticket is originated when a CLEC contacts Qwest through either the AMSC-RSA or the IMA/MEDIACC, through which the CLEC directly accesses WFAC to create the trouble ticket. If the customer enters through the AMSC, the trouble is first analyzed by a Repair Call Expert to determine if it is a trouble, in which case he populates the ticket with the customer name, telephone number or circuit ID, major customer number, and trouble description. In addition, information extracted from the Network Service Data Base including chronic count, LOC A, LOC C, and service code variables are added to fields in the trouble ticket. From WFAC the trouble is analyzed by the Integrated Testing Service; if the trouble is solved, the trouble ticket is closed in WFAC. Otherwise the Designed Service Center routes the

trouble to RCMAC, WFA (DO) or WFA(DI). When the repair technician resolves the trouble the Designed Services Center is notified. WFA Control inputs the data on the clearing times, closed date and time, out-of-service, actual duration, dispatch, actual duration, and trouble type.

2. Overall Summary

MR-7, MR-8, and MR-9 can be released for OSS testing. There are no outstanding exceptions or observations related to these measures.

3. Analysis

Liberty's analysis of these performance measures included interviews and data requests related to the business process and measure calculation. For both the non-designed services that are measured using MTAS data and the designed services that measured using WFAC data, Liberty reviewed:

- Repair Call Centers – to ascertain how trouble reports are taken, when trouble reports are created, what information is gathered, and where trouble reports are processed.
- MEDIACC – to determine the role that MEDIACC plays in the reporting and processing of trouble for wholesale customers and how MEDIACC creates trouble tickets in LMOS and WFAC.
- Line Maintenance Operation System *(LMOS)* – To determine how trouble tickets are created and processed; what information is added and how tickets are cleared and closed; how non-designed service troubles are managed for wholesale customers.
- Recent Change Memory Administration Center *(RCMAC)* – to determine what functions RCMAC performs in the maintenance and repair process and what fields are populated in the trouble ticket by this function.
- Work Force Administration Control *(WFA/Control)* – to identify responsibilities associated with design services trouble tickets; determine how trouble tickets are open and closed; the training for technicians; and auditing responsibilities.
- Work Force Administration/Dispatch Out *(WFA/(DO)* – to discuss responsibilities of the technicians; how trouble tickets are completed for non-designed products; how troubles are cleared and closed; what constitutes a commitment; and how trouble tickets are coded.
- MTAS System – to determine what data are available; how the requirements were determined for the MR performance measures; the storage for trouble ticket data; and the accessibility of information from front-end systems.
- WFAC – to identify the method for storing trouble ticket data and the accessibility of information from front-end systems.
- PANS – to learn how trouble tickets are stored and what format the data are available.
- Wholesale Regulatory Reporting Group – to determine how the performance measures are calculated.

Data Tracking

Liberty tracked MTAS and WFAC data from the front end to the back end of the business processes. Liberty used samples of wholesale and retail trouble tickets for specified time intervals to track data from MTAS to the RRS detailed database. Liberty required Qwest to pull approximately 170 retail and 170 wholesale trouble tickets directly from MTAS prior to its inclusion in the PANS data set. Liberty used time periods containing trouble tickets closed during the time period extending from August 1, 2000 to October 11, 2000 as its population. Liberty specified the variables that were to be provided by Qwest for each trouble ticket in the selection. Liberty requested Qwest pull data for the same time intervals from the RRS detailed data table. Liberty compared each trouble report from MTAS to its counterpart in the RRS detail data table to ensure that the trouble report was included when appropriate and similarly excluded when appropriate. Initially, Liberty did identify discrepancies between the data tables because the time periods for the detail data tables were incorrectly specified during the data extraction process by Qwest. After the time periods were correctly specified, Liberty did not identify any discrepancies. Liberty compared the variables from each data set for accuracy. Again, Liberty did not identify any discrepancies.

Liberty used the same sampling technique for WFAC data. Liberty again identified specific time intervals for each data sample in order to track the data from WFAC to the RRS detail data table. Because Qwest maintains its WFAC data for a rolling 45-day period, Liberty was restricted to using the time period extending from August 27, 2000 to October 11, 2000 for its trouble ticket population. Liberty required Qwest to pull approximately 170 wholesale and 170 retail trouble tickets directly from the WFAC data set and not from archived WFAC data in PANS. Liberty specified the variables that were to be provided by Qwest for each trouble report in the selection. The variables included in the data request were for the most part a subset of the same variables that are included in the detail data table. Liberty then requested Qwest to provide trouble reports from the same time intervals from the RRS detail data table. Liberty compared each WFAC trouble report with its RRS detail database counterpart to determine if the trouble reports that should have been excluded and the trouble reports that should have been included were handled appropriately. Liberty determined that in the WFAC data there were trouble reports with identical numbers that were repeated more than once, however in the detailed data table this did not occur. In addition, there was some time mismatches because of the nature of the data extraction from WFAC and the detail data table. Liberty was able to match all of the trouble reports numbers with their counterparts in the detail database along with the appropriate variables.

Business Process Audit

Because of the importance of the accuracy of the trouble tickets in the calculation of these performance measures, Liberty traced the maintenance and repair process from trouble ticket opened to trouble ticket closed. Liberty interviewed Qwest personnel and reviewed data request responses for each step of the process. In addition, Liberty requested all training manuals, handbooks, and internal audits of the trouble report process. Liberty also conducted interviews with Qwest personnel responsible for the accuracy of trouble reports.

In reviewing the completion of MTAS trouble reports, Liberty was unable to identify the existence of any internal audits or other studies to verify either the accuracy of the MTAS trouble

tickets or the existence of any internal process at Qwest to ensure the accuracy of the MTAS data. In an interview with Qwest personnel, there was an indication that a single study had been completed on the accuracy of the MTAS trouble tickets. However, when the study was requested, Qwest indicated that it was not a rigorous study and declined to provide it to Liberty. Liberty reviewed the training manuals beginning with AMSC training through LMOS and WFA(DO) and other related material. Liberty found that the manuals and materials to be comprehensive and complete. Because certain essential fields on the trouble report are used directly in the calculation of the performance reports, the accuracy of the measurements are dependent upon technician completing the trouble reports accurately.

Liberty also reviewed the WFAC trouble report completion process. WFAC, unlike MTAS, has most of the fields that are essential to the performance measurements completed by WFA Control and not technicians in the field. In addition, WFAC conducts periodic audits of designed trouble ticket accuracy in WFAC centers. Liberty reviewed the results of the audits and though the results were not perfect, Qwest has in place a method for addressing the accuracy problems of the WFAC trouble reports.

Recalculation

Liberty requested data related to MR-7, MR-8, and MR-9 contained in the MTAS and WFAC detail data tables and ad hoc data tables to perform recalculations. To calculate the denominator for MR-8, Liberty requested the TIRKS data contained in the detailed database. The raw data are located in the detail data table that is the result of the initial query where Qwest's programming rules are applied. Most of the specified exclusions occur at this point in the calculation process; the detail data table contains all trouble reports used for the calculation of the performance measures. Business rules are applied by Qwest's programs to the MTAS and WFAC detailed data tables to derive fields in the ad hoc data table to calculate the performance measures.

Liberty's used the states of Iowa, New Mexico, and Washington and the data from the months of July 2000 and August 2000 to recalculate the wholesale performance measures. There were 4,813 trouble tickets in the July MTAS detail data table and 5, 055 trouble tickets in the August MTAS detail data table. The WFAC wholesale detail data tables contained 599 trouble reports in July and 726 in August. Liberty then recalculated MR-7 and MR-9. Liberty was able to accurately recalculate the wholesale performance measures provided by Qwest.

For its retail recalculation, Liberty used July and August for the states of Iowa, New Mexico, and Washington. For the three states there were 155,709 retail trouble reports included in the July MTAS file and 165,532 retail trouble reports in the August MTAS file. The WFAC files were much smaller containing 4,864 trouble reports in July and 10,420 trouble reports in August. In all cases Liberty's results matched those of Qwest.

4. Findings and Conclusions

a. Performance Measure Release Date

MR-7, MR-8, and MR-9 were considered ready-for-release as of February 26, 2001.

b. Exceptions

Exception E1018 reported that the MR-7 and MR-8 calculations were inconsistent with the PID formula. The denominator for MR-7 and the numerator for MR-8 applied by Qwest contained the number of trouble report closed, while the PID required the number of trouble reports received. Qwest proposed changes to the PID to correct this problem; the TAG approved the proposed changes.

Exception E1035 applied to MR-7 and MR-9 and identified what appeared to be incorrect disaggregation of MTAS data. Qwest contended that the coding was correct and provided a clarification of the RRS documentation to support its point. Qwest revised its documentation and Liberty closed the exception.

Exception E1036 applied to MR-7 and reported that certain WFAC retail trouble tickets were being measured as WFAC wholesale trouble and causing MR-7 to be incorrectly calculated. Qwest corrected it SAS code so that the trouble tickets were properly attributed to retail measures.

c. Observations

Observation O1007 reported that the MR-9 calculations were inconsistent with the PID formula. The denominator applied by Qwest contained the number of trouble report closed, while the PID required the number of trouble reports received. Qwest proposed changes to the PID to correct this problem; the TAG approved the proposed changes.

d. Conclusions

MR-7 accurately measures repeat trouble reports occurring within the last 30 days.

MR-8 accurately measures the overall rate of trouble reports.

MR-9 accurately measures repair appointments met.

5. Recommendations

Liberty recommends that Qwest develop an audit process to ensure the accuracy of the MTAS trouble reports. This could be accomplished by using internal auditors with a periodic review by external auditors.

D. MR-10 – Customer and Non-Qwest Related Trouble Reports

1. Introduction and Background

Performance measure MR-10 is intended to help evaluate the extent that trouble reports are customer-related. It provides diagnostic information to help address potential issues that may be raised by the other MR performance measures. MR-10 measures the number of trouble reports

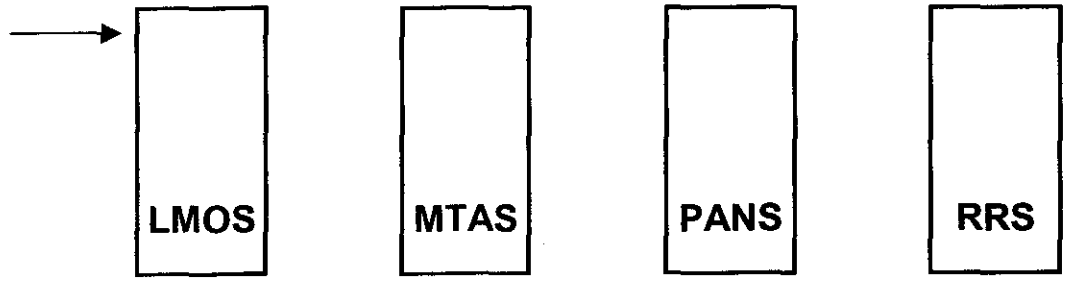
that are attributable to the customer as a percentage of the closed trouble tickets for each product. Reporting for MR-10 is at a statewide level. MR-10 is a diagnostic measure.

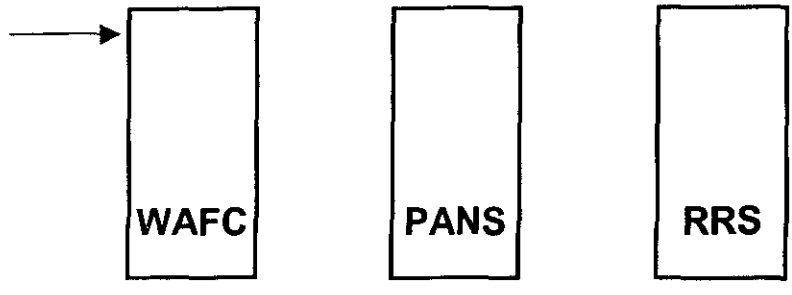
For products measured from MTAS data, trouble reports that are coded with disposition codes for customer action, non-telco plant, trouble beyond network interface, trouble tickets with time delays due to no access, and other miscellaneous trouble are included. Similarly, products measured from WFAC data with trouble codes for carrier action and customer provided equipment are included. Subsequent trouble tickets, internal information trouble tickets, trouble reports received before installation completion, trouble tickets involving official company services, trouble tickets with invalid trouble receipt dates, trouble tickets with invalid cleared or closed dates, trouble reports of problems received on day of installation before provisioning is complete, trouble tickets with invalid product codes, and records with data essential to the calculation of the measure are all excluded.

The formula for MR-10 is:

> *[(Total number of trouble reports coded to disposition codes listed above) / (Total Number of trouble reports closed in the period)] X 100*

The data for MR-10 are processed as shown in the following diagrams and described in the release report for MR-3 through MR-6.





2. Overall Summary

MR-10 provides an accurate measure of non-Qwest-related trouble reports. There are no outstanding observations or exception related to this measure.

3. Analysis

Liberty's review of MR-10 was similar to that described in the release report for MR-3, MR-4, MR-5, and MR-6.

4. Findings and Conclusions

a. Actual PID Release Date

MR-10 can be considered as ready for release as of February 26, 2001.

b. Exceptions

Exception E1018 reported that the MR-10 calculations were inconsistent with the PID formula. The denominator for MR-10 applied by Qwest contained the number of trouble report closed, while the PID required simply the number of trouble reports. Qwest proposed changes to the PID to correct this problem; the TAG approved the proposed changes.

Exception E1036 applied to MR-10 and reported that certain WFAC retail trouble tickets were being measured as WFAC wholesale trouble and causing the measure to be incorrectly calculated. Qwest corrected it SAS code so that the trouble tickets were properly attributed to retail measures.

c. Observations

There were no observations associated with MR-10.

d. Conclusions

MR-10 accurately measures non-Qwest-related trouble reports.

5. Recommendations

Liberty recommends that Qwest develop an audit process to ensure the accuracy of the MTAS trouble reports. This could be accomplished by using internal auditors with a periodic review by external auditors.

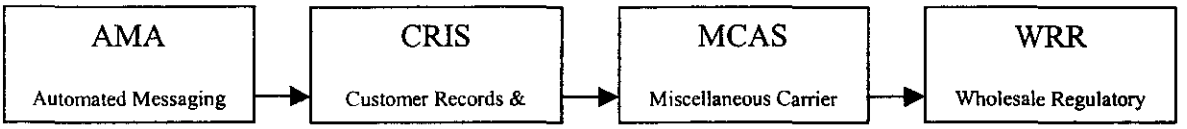
VI. BI – Billing

A. BI-1A – Time to Provide Usage Records – UNEs and Resale

1. Introduction and Background

Performance Measure BI-1 provides a means to evaluate the timeliness with which Qwest provides recorded daily usage records to CLECs. BI-1A measures the recorded daily usage for UNEs and Resale. The standard is parity with Qwest retail and the unit of measure is average number of business days. Qwest disaggregates reporting to the state level. Performance Measure BI-1A compares the time it takes Qwest to make usage details available to CLECs with the time it takes Qwest to make usage details in the same format available to its own customers.

Qwest processes the data for BI-1A as shown in the following diagram.



AMA captures all usage details that Qwest records at the central office switch. A daily file then forwards data to CRIS for formatting, sorting, and applying any necessary rates. CRIS then produces the Daily Usage File *(DUF)*, about three days after usage is recorded. These steps complete the production work of this aspect of billing; the following ones measure performance. CRIS passes the daily usage details to MCAS. At month end, MCAS rolls up the data by CLEC, thereby producing a monthly file. A hard, paper copy then goes to the Wholesale Regulatory Reporting *(WRR)* group, which enters the details manually into a spreadsheet.

WRR calculates the total number of days for the total number of recorded calls. Then it aggregates this data to the regional level. WRR then sends this final spreadsheet to the report generation group, which adds the columns that are required by the established report format, in order to load it into MS Access software. Qwest then queries the data for integrity, *e.g.*, to assure that there is no duplication or erroneously formatted data. Through this step, no performance data is excluded. All manual measures are then loaded into a single master Access database before being loaded into an Oracle database. It is from this data that the final report is produced.

2. Overall Summary

BI-1A is being measured correctly. The process and data for this measure has been traced and recalculated, as is described below.

A part of one exception report (E1012) noted that a title in the performance results report was not complete. This detail error has been corrected.

3. Analysis

Liberty's audit of this performance measure included:

- Conducting interviews of Qwest personnel
- Evaluating the responses to several requests for information
- Validating data transcription
- Reviewing the source system code
- Conducting independent recalculations
- Tracking data through the process.

Liberty interviewed Qwest personnel to ascertain whether the measurement was being performed correctly:

- CRIS/MCAS personnel were interviewed to gain an understanding of how the data is processed and by what means.
- PANS personnel were interviewed to learn how much of the process was automated and how much manual.
- WRR personnel were interviewed for information on how the received data is handled.
- Qwest IT personnel were interviewed to confirm details for current data sources and the schedule for automation of the measurement process.

Qwest provided responses to a number of data requests related to this performance measure. Liberty made these data requests to clarify points made in the interviews, and to gather documentation or data about processes or the data used to measure performance. Specifically requests were made to:

- Determine whether usage data for CLECs were processed the same as it was for Qwest.
- Learn when Qwest anticipated the switch from manual to automatic processing via the PANS system would be made and the schedule of activities involved.
- Obtain the specification documents for billing measure calculation by WRR, the program specification for extraction of data from CRIS to MCAS to WRR and the PANS interface specifications.
- Obtain the electronic files that contain data acquired by the RRS group and the spreadsheet files used or created by RRS relevant to all billing performance measures for the latest two months that are available.
- Obtain the data sent from MCAS to WRR.
- Obtain the spreadsheets produced by WRR for upload into Oracle.

As part of the data tracking and recalculation work, Liberty cross-referenced the hard-copy data provided by the source system with the data entered into the WRR spreadsheet. Liberty reviewed the source-system program code, in order to ensure that no data was erroneously removed or

added. Liberty recalculated the figures provided by Qwest. More specifically, Liberty undertook the following recalculation steps:

- Calculated the "Number of Records" by totaling the figures for each recorded time for each CLEC.
- Calculated the "Total Number of Days" by multiplying the "Number of Records" by "the Average Days". "The Average Days" are provided by the source system.
- Rolled up the figures into state, regional, and total CLEC results.

Liberty then compared these final figures against those in the final appended spreadsheet that is loaded into Access by the Report Generation group. Liberty did not find any discrepancies between the results of its work and those provided by Qwest.

4. Findings and Conclusions

a. Performance Measure Release Date

Liberty considered measure BI-1A to meet the audit-release requirements as of December 19, 2000.

b. Exceptions

One item in exception report E1012 pertained to BI-1A. It was a report labeling detail and it has been corrected.

c. Observations

There were no observation reports addressing BI-1A.

d. Conclusions

This performance measure accurately reports on the time to provide usage records for UNEs and resale.

Parts of Qwest's process for gathering the data and calculating performance results are performed manually. It is Liberty's understanding that Qwest intends to automate more of this process.

5. Recommendations

As the process for reporting BI-1A is automated, the ROC should determine whether a review should be conducted to ensure that accurate results continue to be reported.

B. BI-1B – Time to Provide Usage Records – Jointly Provided Switched Access

1. Introduction and Background

Performance Measure BI-1 provides a means to evaluate the timeliness with which Qwest provides recorded daily usage records to CLECs. BI-1B measures the percentage of recorded daily usage for jointly provided switched access provided within four business days. This interval is measured from the date of the recorded daily usage to the date the usage records are sent to CLECs. The standard is 95 percent within four business days. Qwest disaggregates reporting to the state level and reports at the CLEC aggregate and individual CLEC level.

Records are excluded from the calculation if the state field is not one of Qwest's 14 states and in cases where the CLEC requests other than daily usage transmission. Only the second of these two exclusions is specifically stated in the PID. However, Liberty found that for the months of April and May 2001, no records were excluded.

2. Overall Summary

There was one observation and no exceptions that applied to BI-1B. Qwest has satisfactorily resolved the issues raised in the observation report. The performance measure is ready for release.

3. Analysis

Until recently, Qwest's process for reporting results for BI-1B involved manually inserting data from billing reports into a spreadsheet, and then calculating the results for the state and individual CLEC. Liberty found problems in these manual calculations for the month of December, 2000, and reported the errors in Observation 1018. Liberty found additional problems with the January, 2001, results and supplemented that same observation report on April 1, 2001.

Qwest corrected the errors that Liberty found, but indicated that the permanent solution to the problems was automating the process for collection and manipulation of the data. Those changes have been implemented by Qwest. BI-1B is now like many other performance measures in that the raw data are stored in the PANS systems, and a SAS program (BI1B.sas) is used to collect the data each month in a "Detail" file, and process the records to get only valid jointly provided switched access records, and calculate the elapsed time from usage to providing the usage record to CLECs. Qwest reported results using this method starting with the April 2001 results.

Liberty used Qwest's files and recalculated results for the region, Washington, and Idaho for the month of April 2001, and for the region, Colorado, and Oregon for the month of May 2001. These calculations matched the results reported by Qwest.

4. Findings and Conclusions

a. Performance Measure Release Date

Liberty considered measure BI-1B ready for release as of June 29, 2001.

b. Exceptions

There were no exceptions related to measure BI-1B.

c. Observations

One Observation, 1018, pertained to BI-1B. It dealt with calculation errors that occurred when Qwest was calculating the results manually. Errors that were discovered in the audit were corrected. The automated process now used by Qwest will prevent these types of errors from occurring in the future.

d. Conclusions

BI-1B accurately reports the percentage of usage records provided within four business days for jointly provided switched access.

5. Recommendations

Liberty has no recommendation specifically related to this performance measure.

C. BI-2 – Invoices Delivered within 10 Days

1. Introduction and Background

This measure is intended to help evaluate the timeliness with which Qwest delivers industry-standard, electronically transmitted *(EDI)* bills to CLECs. (EDI consists of a series of standards for transmitting billing data electronically between companies in a structured data format.) It measures the percentage of those bills that Qwest delivers within 10 calendar days, measured by the number of days between the bill date and bill delivery. BI-2 excludes bills transmitted via paper, magnetic tape, CD-ROM or diskette. This performance measure requires disaggregation at the state level; the performance standard is parity-by-design.

On December 19, 2000, Liberty released BI-2, noting that Qwest intended to automate the process used to calculate this measure and change the process so that state-level reporting could be made. Qwest has now completed these changes and this release report supercedes the one issued in December.

The PANS databases acquire billing information from IABS (interexchange access billing system and CRIS (customer record information system) to calculate BI-2. IABS supplies billing information for unbundled dedicated interoffice transport, reciprocal compensation and frame relay resale. All other billing records, and by far the vast majority, come from CRIS. The program "iabs.sas" generates the BI-2 data and, using reference tables and date comparisons, identifies whether each billing record met the 10-day standard.

Liberty's initial audit of this performance measure included conducting several interviews of Qwest personnel, evaluating the responses to several requests for information, validating data transcription, reviewing the source system code, conducting independent recalculations, and

tracking of data through the process. Liberty cross-referenced the hard copy report containing the measurement details with the spreadsheet that is initially produced by WRR. Liberty then recalculated each step of the process. The initial recalculation identified that Liberty had been provided with an erroneous version of the WRR spreadsheet. Liberty's follow-up audit included additional interviews and requests for information and recalculation of performance measure results.

2. Overall Summary

Measure BI-2 is ready for release. The issue raised in Exception Report 1013, the lack of state-level reporting, has been resolved.

3. Analysis

During the audit of BI-2, Liberty noted several updates to the PID that were required to bring the definition up to date. These matters included notes about the availability of state-level reporting and reciprocal compensation billing, as well as the standard terminology about exclusions of records without essential data. Qwest made these changes in version 3.0 of the PID. Liberty noted that in the large number of billing records reviewed, none were excluded because of missing data or improper state designations.

Also during its review of the data for March 2001, Liberty noted that records from the IABS system had not been included in the results as required. During a work session and in a data request response, Qwest confirmed that the IABS results for March had been inadvertently omitted from the report for BI-2 because PANS did not get the IABS data until April 17 and the rest of the data had been acquired and used to produce results on April 8. Qwest implemented process changes to ensure that this type of problem does not occur in the future, not only for BI-2, but also for other measures.

Because the data for this measure includes both wholesale and retail information, the number of records used each month is very large. Liberty limited its recalculation to the states of Colorado and Wyoming and the month of April. This data set included over 42,000 billing records. In addition, Liberty's review included checks to ensure that Qwest's program was applied in the same way to other states and months. Liberty's recalculation matched the results reported by Qwest.

4. Findings and Conclusions

a. Performance Measure Release Date

Liberty considered measure BI-2 to meet audit-release requirements as of June 12, 2001.

b. Exceptions

Exception 1013 identified the lack of state-level reporting. Qwest's performance results now include those at the state level.

c. Observations

There were no observation reports related to BI-2.

d. Conclusions

BI-2 accurately evaluates the timeliness with which Qwest delivers industry standard electronically transmitted bills to CLECs.

5. Recommendations

One minor item to improve the clarity of reporting is that Qwest should label the reported results as "Qwest Retail/CLEC Aggregate" rather than "CLEC" in the monthly results report.

A matter that should be checked as part of continuing monitoring efforts on this and other performance measures is to make sure that system data dumps to PANS occur before Qwest draws data from PANS for monthly results reporting.

D. BI-3A – Billing Accuracy – Adjustments for Errors –UNEs and Resale

1. Introduction and Background

Performance measure BI-3A is intended to help evaluate the accuracy of Qwest's bills to CLECs. It measures the percentage of billed revenue that does not contain errors. The PID formula for this measure is simply the total billed revenue that did not contain errors divided by total billed revenue.

The standard for BI-3A is parity with Qwest retail. Therefore, Qwest also reports the total retail revenue billed without error as a percentage of total retail revenue. There are no exclusions of data for BI-3A; it is reported at a statewide level. The PID defines the amount adjusted off bills due to errors as the sum of all bill adjustments made in the reporting period that involve, either in part or in total, adjustment codes related to billing errors.

Early in the audit of this measure, Liberty discovered that the results being reported by Qwest included all billing adjustments, not just billing errors. This problem was documented in Observation 1004. In order to improve the process for reporting BI-3A, Qwest had to undertake a new effort that took into account various classifications of billing adjustments, and only include those that were billing errors. In discussions related to this matter, the ROC Steering Committee decided that, for the purposes of beginning any OSS testing related to BI-3A, it was acceptable to review the process that Qwest would put in place in its eastern region only, with the understanding that the other two regions would be improved soon thereafter. The Steering Committee also indicated that it wanted Qwest to have data for two months using the new process for the eastern region before the measure could be released for testing.

Qwest completed the process for capturing billing adjustment code information for the five states in its eastern region, and reported results using the new process starting with the months of

January and February, 2001. Liberty audited the new process, recalculated the results for the five states, and checked the results against those reported by Qwest. Liberty issued a release report for BI-3A eastern region on March 29, 2001.

Qwest completed the development of BI-3A for its central and western regions. Liberty audited the results of that development and confirmed that Qwest is now reporting accurate results for BI-3A for the entire Qwest region.

2. Overall Summary

BI-3A can be released. There are no outstanding exceptions or observations related to BI-3A.

3. Analysis

There are several ways that Qwest may record a billing adjustment. The primary and most common method is through the BOSS Billing Order Support System) interface. Through BOSS, users such as customer service representatives can make account adjustments and notations. The major types of adjustments created through BOSS are OC&C (other charges and credits), uncollectibles, monthly service, itemized calls, service & equipment, taxes, and directory assistance. Of these major types, OC&C and itemized calls are the ones likely to contain billing errors. These adjustments make records in the CRIS (customer record information system) called 1236 record types. The other ways to create adjustments are through a mainframe access system, called manual ISPF, and through the CRIS system directly creating 0571 record types. Finally, for wholesale revenues related to unbundled dedicated transport and frame relay resale, IABS (interexchange access billing system) may create adjustments.

The logic that is used to evaluate CRIS 1236 records involves first looking to see if the adjustment is classified as uncollectible. Those records are not considered further for billing errors. Qwest classifies all adjustments as either "uncollectible" or "correct charges." An adjustment is classified as uncollectible when Qwest considers that it has earned the revenue but cannot or will not collect it. Qwest's guidance to personnel making such adjustments instruct that an uncollectible adjustment occurs when (a) the service rendered was adequate and that the charge is correct, (b) the service was in accordance with any applicable tariffs, and (c) the customer is unwilling to pay because the customer believes that the record is incorrect and that the company should assume responsibility under the circumstances. The guidance gives many practical examples of when an adjustment should be considered uncollectible. Liberty concluded that Qwest's process of excluding the uncollectible adjustments is appropriate.

Adjustments are classified as "correct charges" when all information that can be obtained from company records indicates that the service was defective or not fully provided, the charges for service were billed or computed incorrectly, or the charges should have been billed to another customer. Qwest's guidance to personnel making such adjustments include definitions and examples of circumstances in which this classification is used. Qwest's logic for determining billing errors in 1236 adjustments for BI-3A takes adjustments that have been classified as "correct charges" and determines first whether an "Alpha Adjustment Reason Codes" has been entered. There are many possible codes. Liberty reviewed and agreed with Qwest's logic for the determination of whether a particular code should be included as a billing error. If there is no Alpha Adjustment Code, the logic checks to see if a "Qualifier Code" has been used. Again, Qwest classified and Liberty review some of the Qualifier Codes that are used to designate

billing errors. When neither of these codes have entries, which was often the case in the wholesale records that Liberty reviewed, the adjustment is considered a billing error.

Similarly, the adjustments for 0571 records check the qualifier code to determine whether the adjustment should be considered a billing error, and the IABS records for adjustments are checked using another set of adjustment reason codes. When there the codes are not clear about whether an adjustment is a billing error, Qwest counts it as a billing error.

Part of Liberty's audit included a review of the query logic that is used to pull total billed revenue from the corporate data warehouse (CDW). Qwest sums the absolute value of revenue amounts in a similar fashion for both wholesale and retail revenue records. Wholesale records are classified by CLEC ID, while all retail records contain the USWC supplier identification.

Initially, for the eastern region and wholesale billing adjustments, Qwest captured the data in a spreadsheet by individual adjustment, by state, by CLEC, and by whether the adjustment was from CRIS or IABS. Thus all the required reporting disaggregations can be made. Liberty reviewed the spreadsheets generated for November and December, 2000, and January and February 2001. Liberty recalculated these results and compared the results to those reported by Qwest for January and February for the eastern region states: Iowa, Minnesota, North Dakota, Nebraska, and South Dakota. These comparisons proved satisfactory.

Qwest then implemented similar processes in its other two regions and automated the process such that the data required are loaded to the PANS system, and a Regulatory Reporting System program extracts the required data and compute results automatically.

Liberty audited the results of the completed, automated process, including the recalculation of wholesale results for Idaho and Oregon. These recalculations matched the results reported by Qwest for the month of May, 2001. Liberty analyzed the record exclusions made to the data set drawn from PANS. The only exclusion type of significant relative size was that for invalid products. This exclusion is appropriate since the measure only relates to UNEs and resale.

4. Findings and Conclusions

a. Performance Measure Release Date

BI-3A was considered as ready-for-release for Qwest's eastern CRIS region as of March 29, 2001. BI-3A was considered ready-for-release in its entirety on June 29, 2001.

b. Exceptions

Exception 1012 applied to BI-3A in part. This exception noted several anomalies in the performance results for several billing measures. Qwest corrected these problems and Liberty closed the exception on February 1, 2001.

c. Observations

As noted in the introduction, Observation 1004 reported that Qwest had been including all adjustments, not just billing errors, in its reporting of BI-3A. With the changes described above, Qwest has made a considerable improvement in focusing on billing errors.

As part of Liberty's review to determine if Observation 1004 could be closed, however, another problem was discovered with Qwest's prior method for reporting BI-3A. Qwest used a source for total revenue that included affiliates, such as Qwest Wireless and Choice TV, and long distance carrier revenues that should not be part of the BI-3A measure. Even though the amount used for billing errors (all adjustments) was too high, so was the total revenue figure. In some cases, the percentage of correctly billed revenues decreased after reducing the amount considered to be billing errors. Therefore, Liberty concluded that Qwest's historical reporting of BI-3A was not valid. In its report that first included the May 2001 results, Qwest corrected this by only reporting April and May.

d. Conclusions

BI-3A presents a reasonably accurate measure of billing accuracy for UNEs and Resale.

The accuracy of BI-3A could be improved. Liberty found that the method developed by Qwest is likely the most accurate given the data that is currently available. However, Qwest acknowledges that enhancements could be made in the future to increase the data quality. For example, there remains some cases in which adjustments need to be considered billing errors simply because there are no definitive indications otherwise.

5. Recommendations

As the process used for BI-3A has just been completed and there could be further refinements in the classification of billing adjustments, this measure is a candidate for future auditing. However, Liberty has no specific recommendations for BI-3A.

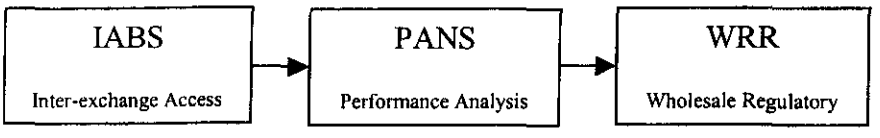
E. BI-3B-Billing Accuracy: Adjustments for Errors – Reciprocal Compensation Minutes-of-Use

1. Introduction and Background

Measure BI-3B helps to evaluate the accuracy with which Qwest bills CLECs for reciprocal compensation minutes-of-use *(RC MOU)*. It reports the percentage of billed revenue adjusted due to errors.

The standard for measure BI-3B standard is 95 percent non-erroneous RC MOU billing. It is disaggregated by state level.

The following diagram shows how data are processed for measure BI-3B.



IABS forwards an invoice file containing the data for both UDIT and RC MOU compensation. The data are split up and UDIT is used as part of the BI-3A calculation. The RC MOU billing data are then processed and sent to PANS and then to WRR. The figures are manually entered

into a spreadsheet and the calculation is performed. The final master spreadsheet is then loaded into Oracle software from which the final report is directly produced.

2. Overall Summary

BI-3B is being measured correctly. The process and data for this measure have been traced and recalculated, as is described below.

Two observations were written against this performance measure: 1004 and 1016. Observation 1004 related to non-error adjustments (such as balance transfers) being included erroneously. Observation 1016 reported on calculation errors. These observations have been satisfactorily resolved.

Exception 1012 noted several minor anomalies in the performance reports and missing data for June and July. These anomalies have been corrected.

3. Analysis

Liberty's audit of this performance measure included:

- Conducting interviews of Qwest personnel
- Evaluating the responses to several requests for information
- Validating data transcription
- Reviewing the source system code
- Conducting independent recalculations
- Tracking data through the process.

Liberty interviewed Qwest personnel to ascertain whether the measurement was being performed correctly:

- PANS personnel were interviewed to deduce how much of the process was automated and how much was manual and by what methods the automation would be performed.
- Wholesale Regulatory Reporting (WRR) personnel were interviewed for information on how the received data is handled by WRR. A Qwest IT person was interviewed to confirm details for current data sources and the schedule for automation of the measurement process.
- The IABS team was interviewed for information regarding the processing of data within IABS and the transfer to CAIMS.
- CAIMS was interviewed for an understanding of the CAIMS interface to WRR.
- In order to check the process for calculation Liberty witnessed a demonstration by WRR of the processing of the source data. The demonstration showed the steps made in order to produce the final master spreadsheet for uploading.

Qwest provided responses to a number of data requests related to this performance measure. Liberty made these data requests to clarify points made in the interviews, and to gather documentation or data about processes or the data used to measure performance. Specifically requests were made to:

- Discuss the schedule for automation from manual to automatic via the PANS system would be made.
- Receive the specification documents for billing measure calculation by WRR, the program specification for extraction of data from CRIS to MCAS to WRR, and the PANS interface specifications.
- Obtain the electronic files that contain data acquired by the RRS group and the spreadsheet files used or created by RRS relevant to all billing performance measures for the latest two months that are available.
- Get the spreadsheets produced by WRR for upload into Oracle.
- Get document containing the list of what constitutes an adjustment error within IABS.

As part of the data tracking and recalculation work, Liberty cross-referenced the hard-copy data provided by the source system with the data entered into the WRR spreadsheet. Liberty reviewed the source-system program code, in order to ensure that no data were erroneously removed or added. Liberty recalculated the figures provided by Qwest. More specifically, Liberty undertook the following recalculation steps:

- Sorted and removed superfluous data
- Calculated the totals for each individual CLEC
- Calculated the state and regional totals for the measure.

4. Findings and Conclusions

a. Actual PID Release Date

Measure BI-3B can be considered as ready for release on February 19, 2001.

b. Exceptions

One exception was raised against BI-3B (E1012). This highlighted a data error and anomalies within the graphical representation of the final report. Both anomalies have been corrected.

c. Observations

Two observations were raised against this measure, O1004 and O1016. The observation 1004 related to non-error adjustments (such as balance transfers) being included erroneously. Qwest made corrections so that only errors would be included in the measure's results. Liberty's recalculations confirmed that non-erred adjustments were excluded. Observation 1016 related to errors in the process of calculating the performance measure. After several corrections, Qwest was able to provide Liberty with data that proved the reported results.

d. Conclusions

This performance measure accurately evaluates the accuracy with which Qwest reflects adjustments for errors with regard to RC MOU.

Parts of Qwest's process for gathering the data and calculating performance results are performed manually. Liberty's recalculation efforts proved that Qwest's process is prone to errors, primarily as a result of data transcription and manual spreadsheet manipulations. Even in its final recalculation, Liberty found one immaterial error in Qwest's work. It is Liberty's understanding that Qwest intends to automate more of this process.

5. Recommendations

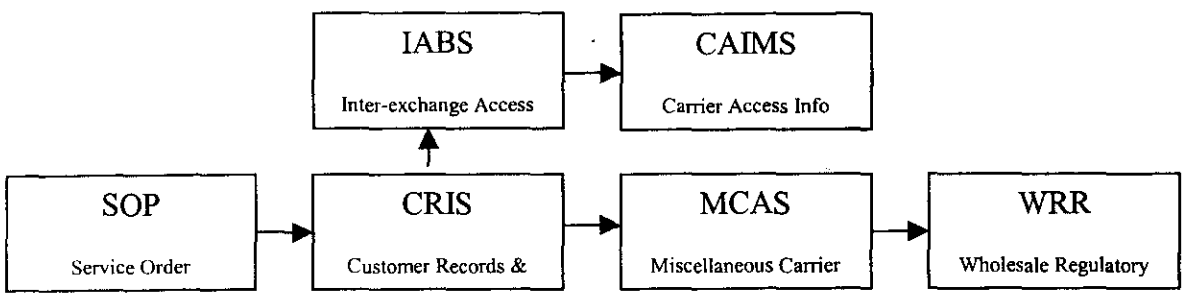
The process used to calculate BI-3B is prone to error. As long as the process retains significant manual steps, Qwest should implement additional quality control checks prior to reporting its results. When the process for reporting BI-3B is more fully automated, the ROC should consider having a review conducted to ensure the accuracy of the performance results.

F. BI-4A – Billing Completeness – UNEs & Resale

1. Introduction and Background

Measure BI-4A helps evaluate the completeness with which Qwest reflects non-recurring and recurring charges associated with completed service orders on the bills.

The following diagram shows how the data are processed for BI-4A.



When a Co-Provider submits a Local Service Request *(LSR)*, Qwest generates one or more service orders, depending on the requested activity or service, to provision and bill the request. Once Qwest completes the requested work for a particular LSR, Qwest notifies the Co-Provider and sends the service order(s) to the billing system. The CRIS billing system receives completed service orders from each of the three regional service order processing systems (SOPS) daily (business days excluding Qwest holidays). Once CRIS receives the orders, it performs the following activities:

- Rates the items on the orders on the basis of tariff information or data from Co-Provider contracts.
- Updates the customer's account in the customer databases to ensure that all customer information is current. CRIS also uses the customer account to ensure end-user usage belonging to the Co-Provider is directed to the correct account.

Once processed, the data are passed onto the MCAS system where they are stored before being rolled up and passed onto WRR in hard copy.

For UDIT and Reciprocal Compensation MOU the data are passed onto and processed within IABS. The data, in the form of invoice files, are then forwarded to the CAIMS data warehouse. A spreadsheet is then sent to Regulatory Reporting who enter the details manually into a spreadsheet.

WRR recalculates the CLEC state figures and compares these against the aggregated figures sent by IABS group. WRR then aggregates these figures into regional results and passes the final master spreadsheet onto the report generation group. They load the report into access and add various columns required by the report. This data are then queried for integrity, *i.e.*, no duplication or erroneously formatted data exists. All manual measures are then loaded into a single master Access database before being loaded into an Oracle database. It is from this data that the final report is produced.

2. Overall Summary

BI-4A is being measured correctly. The process and data for this measure have been traced and recalculated, as described below.

This performance measure had two exceptions reported against it. Exception 1012 noted that the results had not been disaggregated for certain months. Exception 1021 noted various data errors. Both of these exceptions were resolved.

3. Analysis

Liberty's audit of this performance measure included:

- Conducting interviews of Qwest personnel
- Evaluating the responses to several requests for information
- Validating data transcription
- Reviewing the source system code
- Conducting independent recalculations
- Tracking data through the process.

Liberty interviewed Qwest personnel to ascertain whether the measurement was being performed correctly, including personnel from the following groups:

- CRIS/MCAS – to gain an understanding of how the data are processed and by what means.
- PANS – to determine how much of the process was automated and how much was manual, and by what methods the automation was performed.
- Wholesale Retail Reporting – for information on how the received data are handled.
- Qwest IT – to confirm details for current data sources and the schedule for automation of the measurement process.
- IABS team – for information regarding the processing of data within IABS and the transfer to CAIMS.
- CAIMS – for an understanding of the CAIMS interface to WRR.
- Liberty also witnessed a demonstration of the calculation by the WRR.

Qwest provided responses to a number of data requests related to this performance measure. Liberty made these data requests to clarify points made in the interviews, and to gather documentation or data about processes or the data used to measure performance. Specifically requests were made to get:

- the schedule for automation from manual to automatic via the PANS system would be made.
- the specification documents for billing measure calculation by WRR, the program specification for extraction of data from CRIS to MCAS to WRR, and the PANS interface specifications.
- the electronic files that contain data acquired by the RRS group and the spreadsheet files used or created by RRS relevant to all billing performance measures for the latest two months that are available.
- the data sent from MCAS to WRR.
- the spreadsheets produced by WRR for upload into Oracle.
- a clarification that recurring charges are included in the BI-4A calculation.
- a clarification of the figures reported in the June report for BI-4A.
- the Access Master database file for upload into Oracle.

As part of the data tracking and recalculation work, Liberty cross-referenced the hard-copy data provided by the source system with the data entered into WRR's spreadsheet. Liberty reviewed the source-system program code to ensure that no data were erroneously removed or added. Liberty recalculated the figures provided by Qwest. More specifically, Liberty undertook the following recalculation steps:

- Rolled up the source data
- Calculated the denominator by dividing the "LATE S/O" by the "% of T S/O" for each CLEC

- Determined the numerator by subtracting the "LATE S/O" number from the denominator for each CLEC
- Calculated the "% ONTIME Result" by dividing the numerator by the denominator for each CLEC.

In the course of rolling up from individual CLECs to state, Liberty identified a number of anomalies with the data. Liberty issued two exceptions (E1012 and E1021) to identify these anomalies.

Some minor errors were found in the process of calculating the UDIT result. However these affected the result by less than 0.01 percent and were therefore not considered significant.

Liberty did not find any discrepancies between the results of its work and those provided by Qwest.

4. Findings and Conclusions

a. Actual PID Release Date

BI-4A can be considered as ready for release on January 31, 2001.

b. Exceptions

Liberty raised two exceptions on this measure during this audit.

Exception 1012 stated that data had not been disaggregated for April and May. This was due to a historical limitation of the reporting system. All future months have subsequently been disaggregated.

Exception 1021 identified a multitude of data errors that were due to incorrect data being passed to Liberty. Subsequent evaluation of the correct data files has proved correct.

c. Observations

No observations were raised with regard to this measure.

d. Conclusions

This performance measure accurately measures the completeness with which Qwest reflects non-recurring and recurring charges associated with completed service orders on the bills correctly.

Parts of Qwest's process for gathering the data and calculating performance results are performed manually. It is Liberty's understanding that Qwest intends to automate more of this process.

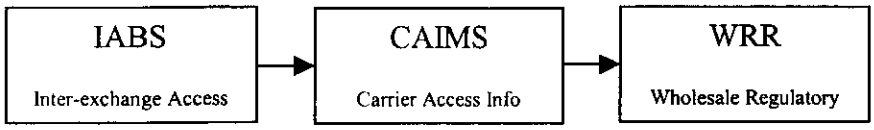
5. Recommendations

As the process for reporting BI-4A is automated, the TAG should determine whether a review should be conducted to ensure that accurate results continue to be reported.

G. BI-4B - Billing Completeness for Reciprocal Compensation

1. Introduction and Background

Measure BI-4B addresses the completeness with which Qwest bills for service to CLECs reflect the revenue for those local minutes of use (MOU) that are associated with CLEC local traffic over Qwests network. The following diagram illustrates the path taken by data that apply to the measurements made under BI-4B.



The focus of Performance Measure BI-4B is reciprocal compensation. IABS processes, among much other information, the MOU data that relate to reciprocal compensation. Invoice files that contain the data flow from IABS to the CAIMS data warehouse. The data is designed to include all CLECs that have reciprocal compensation MOU and that have an established Billing Account Number *(BAN)*. Qwest uses an IABS report to update status spreadsheets, which note any changes to the status of BANs or contract types as they relate to this measure. IABS verifies the changes that have been made, and it checks for subsequent updates, which are included as part of the reference data for the final spreadsheet that is used to calculate performance results.

Qwest extracts measurement data from the CAIMS system via the FOCUS Recip 271 report. This report returns all L04 Billing Account Numbers, whether they involve reciprocal compensation, Bill-and-Keep, or any other contract type. Qwest manually identifies the contracts that involved reciprocal compensation MOU from this report, and enters the data associated with them, again manually, into the final spreadsheet. The spreadsheet provides performance results by state and by CLEC and for Qwest. The spreadsheet is then forwarded to WRR, which creates a single regional master spreadsheet that displays performance results.

This final spreadsheet is forwarded to the report generation group. This group adds various columns that are necessary to meet the monthly-results report-format requirements, in order to load the spreadsheet into MS Access. Qwest personnel they query this data to test its integrity, *e.g.*, whether duplication or erroneously formatted data exist. Through this point in the process, Qwest excludes no data from the performance measurement process. After performing the integrity queries, Qwest loads the manually derived measures into a single master Access database. The data is then loaded into an Oracle database, which Qwest uses to produce the final monthly report for this measure.

2. Overall Summary

BI-4B is reported accurately. All audit issues associated with this measure have been resolved.

3. Analysis

Liberty undertook the following steps its examination of Performance Measure BI-4B:

- A number of interviews were conducted
- The responses to data requests were examined
- The status spreadsheet was validated in the IABS & TAXI systems
- The status spreadsheet was compared against the final spreadsheet that was sent along for use in results calculation
- The CAIMS report was validated against the data sent in the final spreadsheet
- The logic of the CAIMS report was reviewed
- The calculation performed by WRR was recalculated independently by Liberty
- The data sent by WRR to the report generation group was cross-referenced for validity.

Each of these steps is described in more detail below. Liberty interviewed the following in order to ascertain whether the measurement was being performed correctly:

- CRIS/MCAS experts, in order to gain an understanding of how the data is processed and by what means
- PANS experts, in order to determine how much of the process was automated, how much was manual, and by what methods the automation would be performed
- Wholesale Regulatory Reporting personnel, in order to secure information on how WRR handles the data that it receives
- Qwest IT personnel, in order to confirm details for current data sources and the schedule for automation of the measurement process
- The IABS team, in order to gain information regarding the processing of data within IABS and the transfer to CAIMS
- CAIMS experts, in order to develop an understanding of the CAIMS interface to WRR.

Liberty made a number of data requests. The data requests were made to clarify points made in the interviews and to gather documentation or data. Specifically requests were made to identify:

- When the schedule for changing from manual to automatic data extraction from the PANS system would be made
- The specification documents for billing measure calculation by WRR, the program specification for extraction of data from CRIS to MCAS to WRR and the PANS interface specifications
- The electronic files that contain data acquired by the RRS group and the spreadsheet files used or created by RRS relevant to all billing performance measures for the latest two months available
- The data sent from CAIMS to WRR
- The spreadsheets produced by WRR for upload into Access

- The Access Master database file for upload into Oracle
- A copy of the program code for the FOCUS Recip 271 report.

Liberty tested the status spreadsheet by sampling different data types and cross checking those set forth in the IABS & TAXI systems against the reported values in the status spreadsheet. Specifically Liberty examined the following cases:

- CLECs with no BAN established
- CLECs with new BANs established in the last month
- CLECs Contract types, in order to ensure that all were for Reciprocal Compensation.

Liberty then compared the status spreadsheet against the final spreadsheet, both of which had been updated for the September month end. The comparisons showed no inconsistencies between the two spreadsheets.

CAIMS produces the FOCUS Recip 271 report. This provides the numerator, denominator, and result for each CLEC by state and for Qwest. The company runs this report, which attributes the values to the correct CLEC or Qwest in the final spreadsheet. Liberty independently cross-referenced these values, and verified that they were correct for the September data. Liberty also checked the program code logic for the FOCUS Recip 271 report, in order to ensure that it was accurately capturing the correct data.

After the data comes to WRR, the group aggregates it to the state and regional levels. This aggregation produces one result per state, one per region, and a final aggregated result for all CLECs and Qwest. Liberty used the original data for May and June to recalculate results. This exercise produced the same results that Qwest reported.

Liberty cross-referenced the final spreadsheet entries with the data that is loaded by the report generation group into Oracle.

Each of these validation and recalculation processes replicated Qwest's results for each step.

4. Findings and Conclusions

a. PID Release Date

Liberty considered measure BI-4B to meet the audit-release requirements as of November 13, 2000.

b. Exceptions

A portion of Exception 1012 concerns Performance Measure (part of) BI-4B. The relevant portion of that exception, which primarily addresses other performance measures, was that the title for the table "Billing Completeness (Percent) Reciprocal Compensation" should make reference to "BI-4B", not to "BI-4." This change, which has been made in Qwest's most recent

monthly performance results (dated October 27, 2000), did not affect the accuracy of results measurement.

c. Observations

There have been no observations about this performance measure.

d. Conclusions

Measure BI-4B correctly evaluates the completeness with which Qwest reflects the revenue for local minutes of use (MOU) associated with CLEC local traffic over Qwests network on the bills. Qwest currently conducts its measurement process with the use of manual processes. There are plans for automation. Liberty has audited only the current manual processes; it has made no test of the operation of the automated processes, which were not in use when this part of the audit was completed.

5. Recommendations

Qwest's measurements under Performance Measure BI-4B can be considered sufficiently reliable for release in connection with any applicable OSS testing, subject to one qualification. The planned automation date for PID BI-4B was December 31, 2000. Measurements under this new process can be expected to appear in the performance results report that is issued in March.